Sub-Giga Modem for Smart Meter

NAMR-P229SR User Manual

FCC ID : 2BF2ENAMR-P229

Author: NURI Flex INC

Version: 1.0

.

Document Title:	NAMR-P229SR User Manual	Date:	2024-05-02
File Name:	Manual	Status:	
Version:	1.00	Page:	1 of 12
Owner:	NURI Flex	Document ID:	

Document Information

This document is published in Korea. And this chapter contains specific information of revised history.

Revision History

Ver.	Date	Name	Overview of changes
1.0	Feb, 2023	SH.Kang	- First Draft

FCC caution

This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions

    (1) This device may not cause harmful interference

    (2) This device must accept any interference received, including interference that may cause undesired operation.

CAUTION: Changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

NOTE: This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures :

Document Title:	NAMR-P229SR User Manual	Date:	2024-05-02
File Name:	Manual	Status:	
Version:	1.00	Page:	2 of 12
Owner:	NURI Flex	Document ID:	

- Reorient or relocate the receiving antenna

- Increase the separation between the equipment and receiver

- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected

- Consult the dealer or an experienced radio/TV technician for help.

FCC Radiation Exposure Statement:

This equipment complies with FCC radiation exposure limits set forth for an uncontrolled environment. This equipment should be installed and operated with minimum distance 20cm between the radiator & your body. This module is designed to comply with the FCC statement, FCC ID is : 2BF2ENAMRP-229

OEM INTEGRATION INSTRUCTIONS:

This device is intended only for OEM integrators under the following conditions :

The module must be installed in the host equipment such that 20 cm is maintained between the antenna and users, and the transmitter module may not be co-located with any other transmitter or antenna. The module shall be only used with the internal on-board antenna that has been originally tested and certified with this module. External antennas are not supported. As long as these 3 conditions above are met, further transmitter test will not be required.

However, the OEM integrator is still responsible for testing their end-product for any additional compliance requirements required with this module installed (for example, digital device emissions, PC peripheral requirements, etc.). The end-product may need Verification testing, Declaration of Conformity testing, a Permissive Class II Change or new Certification. Please involve a FCC certification specialist in order to determine what will be exactly applicable for the end-product.

Validity of using the module certification:

In the event that these conditions cannot be met (for example certain laptop configurations or co-location with another transmitter), then the FCC authorization for this module in combination with the host equipment is no longer considered valid and the FCC ID of the module cannot be used on the final product. In these circumstances, the OEM integrator will be responsible for re-evaluating the end product (including the transmitter) and obtaining a separate FCC authorization. In such cases, please involve a FCC certification specialist in order to determine if a Permissive Class II Change or new Certification is required.

Upgrade Firmware:

Information for OEM Integrator

Document Title:	NAMR-P229SR User Manual	Date:	2024-05-02
File Name:	Manual	Status:	
Version:	1.00	Page:	3 of 12
Owner:	NURI Flex	Document ID:	

This device is intended only for OEM integrators under the following conditions：

1) The antenna must be installed such that 20 cm is maintained between the antenna and users, and

2) The transmitter module may not be co-located with any other transmitter or antenna.

End product labelling

The label for end product must include

"Contains FCC ID:" 2BF2ENAMR-P229 ".

" CAUTION: Exposure to Radio Frequency Radiation.

This equipment complies with FCC radiation exposure limits set forth for an uncontrolled environment. This equipment should be installed and operated with minimum distance of 20cm between the radiator and your body. This transmitter module is authorized only for use in device where the antenna may be installed such that 20 cm may be maintained between the antenna and users."

Requirement per KDB996369 D03

2.2 List of applicable FCC rules

List the FCC rules that are applicable to the modular transmitter. These are the rules that specifically establish the bands of operation, the power, spurious emissions, and operating fundamental frequencies. DO NOT list compliance to unintentional-radiator rules (Part 15 Subpart B) since that is not a condition of a module grant that is extended to a host manufacturer. See also Section 2.10 below concerning the need to notify host manufacturers that further testing is required.3

- This module meets the requirements of FCC part 15C(15.247). See below 2.2 NAMR-P229SR specification

2.3 Summarize the specific operational use conditions

Describe use conditions that are applicable to the modular transmitter, including for example any limits on antennas, etc. For example, if point-to-point antennas are used that require reduction in power or compensation for cable loss, then this information must be in the instructions. If the use condition limitations extend to professional users, then instructions must state that this information also extends to the host manufacturer's instruction manual. In addition, certain information may also be needed, such as peak gain per frequency band and minimum gain, specifically for master devices in 5 GHz DFS bands

- The EUT has a whip Antenna, and the antenna use a permanently attached antenna which is not replaceable.

2.4 Limited module procedures

If a modular transmitter is approved as a "limited module," then the module manufacturer is responsible for approving the host environment that the limited module is used with. The manufacturer of a limited module must describe, both in the filing and in the installation instructions, the alternative means that the limited module manufacturer uses to verify that the host meets the necessary requirements to satisfy the module limiting conditions.

A limited module manufacturer has the flexibility to define its alternative method to address the conditions that limit the initial approval, such as: shielding, minimum signaling amplitude, buffered modulation/data inputs, or power supply regulation. The alternative method could include that the limited module manufacturer reviews detailed test data or host designs prior to giving the host manufacturer approval.

This limited module procedure is also applicable for RF exposure evaluation when it is necessary to

demonstrate compliance in a specific host. The module manufacturer must state how control of the product into which the modular transmitter will be installed will be maintained such that full compliance of the product is always ensured. For additional hosts other than the specific host originally granted with a limited module, a Class II permissive change is required on the module grant to register the additional host as a specific host also approved with the module.

- The Module is not a limited module

2.6 RF exposure considerations

It is essential for module grantees to clearly and explicitly state the RF exposure conditions that permit a host product manufacturer to use the module. Two types of instructions are required for RF exposure information: (1) to the host product manufacturer, to define the application conditions (mobile, portable – xx cm from a person's body); and (2) additional text needed for the host product manufacturer to provide to end users in their end-product manuals. If RF exposure statements and use conditions are not provided, then the host product manufacturer is required to take responsibility of the module through a change in FCC ID (new application).

- This module complies with FCC RF radiation exposure limits set forth for an uncontrolled environment, This equipment should be installed and operated with a minimum distance of 20 centimeters between the radiator and your body." This module is designed to comply with the FCC statement, FCC ID is: 2BF2ENAMR-P229.

2.7 Antennas

A list of antennas included in the application for certification must be provided in the instructions. For modular transmitters approved as limited modules, all applicable professional installer instructions must be included as part of the information to the host product manufacturer. The antenna list shall also identify the antenna types (monopole, PIFA, dipole, etc. (note that for example an "omni-directional antenna" is not considered to be a specific "antenna type")).

Document Title:	NAMR-P229SR User Manual	Date:	2024-05-02
File Name:	Manual	Status:	
Version:	1.00	Page:	5 of 12
Owner:	NURI Flex	Document ID:	

For situations where the host product manufacturer is responsible for an external connector, for example with an RF pin and antenna trace design, the integration instructions shall inform the installer that unique antenna connector must be used on the Part 15 authorized transmitters used in the host product. The module manufacturers shall provide a list of acceptable unique connectors.

- The EUT has a whip Antenna, and the antenna use a permanently attached antenna which is unique.

2.8 Label and compliance information

Grantees are responsible for the continued compliance of their modules to the FCC rules. This includes advising host product manufacturers that they need to provide a physical or e-label stating "Contains FCC ID" with their finished product. See Guidelines for Labeling and User Information for RF Devices‑KDB Publication 784748.

- The host system using this module, should have label in a visible area indicated the following texts: "Contains FCC ID: 2BF2ENAMR-P229."

2.9 Information on test modes and additional testing requirements5

Additional guidance for testing host products is given in KDB Publication 996369 D04 Module Integration Guide. Test modes should take into consideration different operational conditions for a stand-alone modular transmitter in a host, as well as for multiple simultaneously transmitting modules or other transmitters in a host product.

The grantee should provide information on how to configure test modes for host product evaluation for different operational conditions for a stand-alone modular transmitter in a host, versus with multiple, simultaneously transmitting modules or other transmitters in a host.

Grantees can increase the utility of their modular transmitters by providing special means, modes, or instructions that simulates or characterizes a connection by enabling a transmitter. This can greatly simplify a host manufacturer's determination that a module as installed in a host complies with FCC requirements

- Top band can increase the utility of our modular transmitters by providing instructions that simulates or characterizes a connection by enabling a transmitter.

2.10 Additional testing, Part 15 Subpart B disclaimer

The grantee should include a statement that the modular transmitter is only FCC authorized for the specific rule parts (i.e., FCC transmitter rules) listed on the grant, and that the host product manufacturer is responsible for compliance to any other FCC rules that apply to the host not covered by the modular transmitter grant of certification. If the grantee markets their product as being Part 15 Subpart B compliant (when it also contains unintentional-radiator digital circuity), then the grantee shall provide a notice stating that the final host product still requires Part 15 Subpart B compliance testing with the modular transmitter installed.

- The module without unintentional-radiator digital circuity, so the module does not require an evaluation by FCC Part 15 Subpart B. The host should be evaluated by the FCC Subpart B.

Document Title:	NAMR-P229SR User Manual		Date:	2024-05-02
File Name:	Manual		Status:	
Version:	1.00		Page:	6 of 12
Owner:	NURI Flex		Document ID:	

Preface

› Registered Trademark

NURI, AiMiR is a registered trademark of NURI Flex, Co. Ltd. All third party trademarks mentioned in this document may be trademarks of their respective owners.

› Proprietary Notice

The information contained in this documentation is subject to change without notice.

NURI Flex reserves the right to make changes in content without obligation on the part of NURI Flex to provide notification of such changes.

NURI Flex may make improvements or changes in the product(s) and/or the program(s) described in this documentation at any time.

NURI Flex expressly disclaims all responsibility and liability for any damage or loss arousing out of other use than as specified in this documentation.

The product(s) is owned by NURI Flex and is protected by patent and copyright laws.

No part of the product (including but not limited to idea(s) for the product, the manual, etc.) may be reproduced in any form or by any means or used to make any derivative work (such as translation, transformation, or adaptation) without written permission from NURI Flex.

› Customer Support

Head office

Address: Nurifelx INC, Nuriflex INC 2300-10900 NE 4TH ST Bellevue, PR 98004-5882

Tel: +1 (201) 554-8494 US

E-mail: *elevas.park@nuriflex.com*

Address: NURI Flex Co.,Ltd, NURI Bld, 750-14, Bangbae-dong, Seocho-gu, Seoul, Korea, 137-060

Tel: +82-2-781-0777

Fax: +82-2-781-0704

E-mail: *poweramr@nuriflex.co.kr*

Website: *http://www.nuriflex.co.kr*

Document Title:	NAMR-P229SR User Manual	Date:	2024-05-02
File Name:	Manual	Status:	
Version:	1.00	Page:	7 of 12
Owner:	NURI Flex	Document ID:	

Table of Contents

Document Title:	NAMR-P226SR User Manual	Date:	2024-05-02
File Name:	Manual	Status:	
Version:	1.1	Page:	8 of 12
Owner:	NURI Fle	Document ID:	

1 Introduction

NAMR-P229SR is a ZigBee modem that gets Smart Meter's data and sends metering data to DCU by using RF network (ZigBee). And it is one of devices for NURI Flex's end-to-end AiMiR Advanced Metering Infrastructure (AMI) solutions.

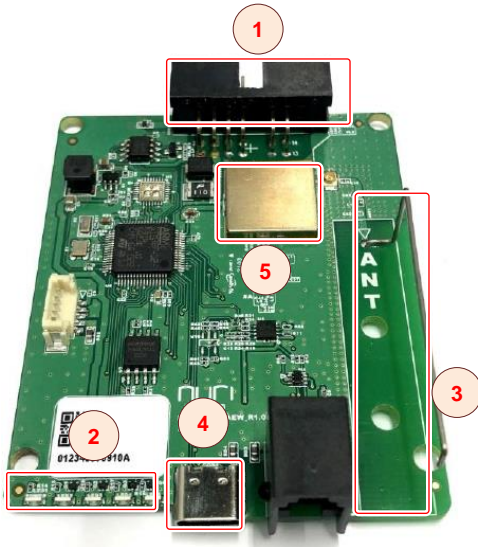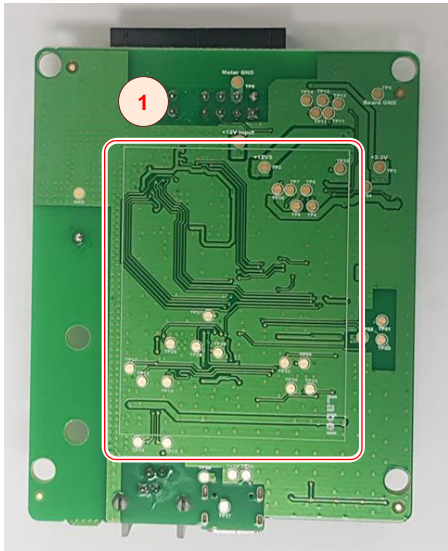## 1.1   Main Features

NAMR-P229SR provides following features:

* Communicates with electronic electricity meters

* Supports communication security when transmitting/receiving wireless network data

* Supports Packet communication by using built-in Zigbee Protocol Stack

* Supports checking status by using the LED

* Supports checking status by using the Debug Mode

* Can change settings using Magnetic Sensor

* Provides Self-diagnosis and Self-recovery functions.

Document Title:	NAMR-P229SR User Manual	Date:	2024-05-02
File Name:	Manual	Status:	
Version:	1.00	Page:	9 of 12
Owner:	NURI Flex	Document ID:	

2 Description of Modem

2.1 NAMR-P229SR Appearance

The appearance of NAMR-P229SR is as follows:

Name	Figure	Description
Top Layer		**(1)** Connector for Meter Interface **(2)** LED for status display **(3)** Internal Antenna **(4)** Debug Port **(5)** RF Part
Bottom Layer		**(1)** FCC - Euid Label.

Document Title:	NAMR-P229SR User Manual	Date:	2024-05-02
File Name:	Manual	Status:	
Version:	1.00	Page:	10 of 12
Owner:	NURI Flex	Document ID:	

2.2   NAMR-P229SR Specification

The specification of NAMR-P229SR is as follows:

Item		Specification
General	DC Power Input	DC +12V
	Processor	STM32F412RGFb / 32-bit ARM Cortex-M4
	Memory	1MB Flash, 256KB RAM
	X-Tal	24Mhz (Main), 32.768Khz (RTC), 40Mhz(RF)
	External Memory	Serial Flash 8M Byte
	Interface	UART (Metering), J-Tag (Debug)
	RF Standard	FCC 15.247
	RF Frequency range	2GFSK : 903MHz~927MHz
	Receive Sensitivity	Typ. -91.3 dBm ~ -94.8 dBm
	Antenna Type	Internal whip Antenna
	Antenna Gain	-3.0dBi
	Maximum output Power	Max. 12dbm
	Current Consumption	RX : 0.3W , TX : 1.5W
	Operating Temperature	-40℃ ~ +70℃
	Storage Temperature	-40℃ ~ +80℃
	Weight	22.5g
	Dimension (mm)	75.5 (W) X 60.5 (H) X 17.7 (D)

2.3   LED Indicator

Item	LED	Description
1	Modem Power	GREEN On - Operating status
3	Gateway connection	BLUE Blink – Gateway connection status.
3	Modem RX sensitivity (RX)	GREEN Blink – Rx level senstivity.
4	Modem T/RX state	BLUE Blink – Modem T/RX Operating status
5	Modem and Meter Transmitted	ORANGE Blink – Network joining.

Document Title:	NAMR-P229SR User Manual	Date:	2024-05-02
File Name:	Manual	Status:	
Version:	1.00	Page:	12 of 12
Owner:	NURI Flex	Document ID:	